

In the Claims:

Please cancel claims 1 to 7 and add claims 8 to 15 as follows:

8. A method for operating a mixed-potential exhaust-gas probe for an internal combustion engine, the exhaust-gas probe including: a heatable probe ceramic; a first electrode arranged in a chamber subjected to a reference atmosphere; and, a second  
5 electrode, which detects gas molecules, and is arranged in the exhaust gas of the internal combustion engine; the method comprising the steps of:

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10 providing a pump voltage source and applying a pump voltage across the first and second electrodes so that, in the interior of the chamber, a somewhat reduced oxygen partial pressure is adjusted by the electrochemical pumping off of the oxygen molecules;

15 applying a constant external voltage to the electrodes with this voltage deviating from the thermodynamic equilibrium voltage of the wanted reaction; and,

measuring and evaluating the current dropping across the electrodes.

9. The method of claim 8, comprising the further step of experimentally determining the optimal voltage for detecting individual mixed potentials of individual components of the exhaust gas.

10. A method for operating a mixed-potential exhaust-gas probe for an internal combustion engine, the exhaust-gas probe including: a heatable probe ceramic detecting gas molecules; a first electrode mounted in a chamber and the first electrode  
5 being subjected to a reference atmosphere; and, a second electrode arranged in the exhaust gas of the internal combustion engine; the method comprising the steps of:

providing a pump voltage source and applying a pump voltage across the first and second electrodes so that a somewhat reduced  
10 oxygen partial pressure is adjusted in the interior of the chamber by electrochemically pumping off the oxygen molecules; and,

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15 applying a constant current to the probe ceramic and measuring and evaluating the voltage adjusting between the first and second electrodes with this voltage deviating from the thermodynamic equilibrium voltage of the desired reaction.

11. The method of claim 10, comprising the further step of experimentally determining the current for detecting individual mixed potentials of individual components of the exhaust gas.

12. A circuit arrangement for carrying out a method for operating a mixed-potential exhaust-gas probe for an internal combustion engine, the exhaust-gas probe including: a heatable probe ceramic; a first electrode arranged in a chamber subjected  
5 to a reference atmosphere; and, a second electrode, which detects gas molecules, and is arranged in the exhaust gas of the internal combustion engine; the method comprising the steps of: providing

a pump voltage source and applying a pump voltage across the first and second electrodes so that, in the interior of the chamber, a somewhat reduced oxygen partial pressure is adjusted by the electrochemical pumping off of the oxygen molecules; applying a constant external voltage to the electrodes with this voltage deviating from the thermodynamic equilibrium voltage of the wanted reaction; and, measuring and evaluating the current dropping across the electrodes; the arrangement comprising:

an inverting operational amplifier having a non-inverting input, an inverting input and a feedback loop;

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a voltage divider R2 connected to said non-inverting input; the exhaust-gas probe being connected to said inverting input;

a reference resistor R1 arranged in said feedback loop; and, a difference amplifier which amplifies the voltage difference between said non-inverting input and the output of the operational amplifier and outputs the difference as a measurement signal.

13. The circuit arrangement of claim 12, further comprising a switching device for switching the circuit arrangement for the voltage polarized current measurement over to the circuit arrangement for current polarized voltage measurement.

14. A circuit arrangement for carrying out a method for operating a mixed-potential exhaust-gas probe for an internal combustion engine, the exhaust-gas probe including: a heatable probe ceramic detecting gas molecules; a first electrode mounted

5 in a chamber and the first electrode being subjected to a  
reference atmosphere; and, a second electrode arranged in the  
exhaust gas of the internal combustion engine; the method  
including the steps of: providing a pump voltage source and  
applying a pump voltage across the first and second electrodes so  
10 that a somewhat reduced oxygen partial pressure is adjusted in  
the interior of the chamber by electrochemically pumping off the  
oxygen molecules; and, applying a constant current to the probe  
ceramic and measuring and evaluating the voltage adjusting  
between the first and second electrodes with this voltage  
deviating from the thermodynamic equilibrium voltage of the  
desired reaction; the arrangement comprising:

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a non-inverting operational amplifier having a non-inverting  
input, an inverting input and a feedback loop;

20 a voltage divider R2 connected to the non-inverting input;  
a reference resistor R1 connected to the inverting input;  
said exhaust-gas probe being arranged in said feedback loop; and,  
a difference amplifier for amplifying the voltage difference  
at the sensor and outputting said voltage difference as a  
measurement signal.

15. The circuit arrangement of claim 14, further comprising a  
switching device for switching the circuit arrangement for the  
voltage polarized current measurement over to the circuit  
arrangement for current polarized voltage measurement.